

We leave our readers to form their own opinions upon conclusions Nos. 2 and 3. It is a pity they are to be found in "Molesworth," because they may lead students and others to form the opinion that these most important details are matters of no consequence. The compound locomotive naturally is included in the new matter added to this edition, and being of great interest to all connected with railways, we expected to find the subject thoroughly up to date. In this we are disappointed; two-thirds of a page is considered ample space to discuss this important question, the other third being taken up with a few lines on American locomotive practice! American locomotive engineers do not consider the two-cylinder arrangement for compounding "most suitable," nor does Mr. F. W. Webb, the able locomotive superintendent of the L. and N.W. Railway. Surely these two subjects are worthy of more space and better treatment.

On p. 466 we notice a formula having reference to the blast pipe of locomotive engines, applying in particular to the exhaustive power of the pipe, as the efficiency of a blast pipe seems to depend more on its vertical position in the smoke-box than on anything else. This fact might have been noted with advantage.

The rule given on p. 499 for the safe load on locomotive springs, by Mr. D. K. Clark, is found to be rather excessive; the constant 11.3 can be increased with advantage to 15, the result thus obtained being the actual load to be carried. Notwithstanding these few weaknesses, Molesworth's Pocket-Book is, without doubt, incomparably the best of its kind; and so accustomed have engineers, and particularly draughtsmen, become to the continual use of this valuable book that most of them would be now really lost without it.

This book is clearly and well printed, nicely got up, and is a credit to all concerned in its publication.

THE AMERICAN CATALOGUE OF MEDICAL LITERATURE.

Index Catalogue of the Library of the Surgeon-General's Office U.S. Army. Vol. xii. (Reger—Shuttleworth), pp. 1004, 1892, and vol. xiii. (Sialogues—Sutugin), pp. 1005. Imp. 8vo. Washington, (Government Printing Office, 1893.)

IT is a great pleasure to all who are interested in any form of library or literature to observe how punctually, year by year, these magnificent volumes appear, and show in a very practical way how American enterprise can deal with old-world questions of gathering together and keeping up a collection of books that is superior in its own department to any other, and which has been got together in little more than thirty years. What is framed as an Index Catalogue of the Library of the Surgeon-General's Office at Washington constitutes in effect a dictionary of all medical and surgical literature, ancient and modern, with very few *lacunæ*; the entries under authors' headings have now reached 240,007, and under subject-headings 539,927; and the attempt which at first sight may well have seemed too ambitious—viz. to catalogue under subject-headings all the signed articles which touch on medicine which exist in the periodical publications of all languages, as well as to cross-

catalogue all medical books and pamphlets of the world under both author and subject-headings—has turned out perfectly successful. In the first eleven volumes there were mentioned 3,929 periodical publications which were thus treated; in the two more volumes which are before us there are 341 additions, and though some of the older ones may have died out, yet the labour remaining is obviously no light one. The thirteenth volume brings us within sight of the end, and it is probable that two years more may finish the first edition of the catalogue; yet it cannot but be that some provision, by supplement or otherwise, must be made for the literature which during fifteen years has been accumulating under the headings of the earlier volumes, and some arrangement must be made for the literature of the future. From the monthly issues of the *Index Medicus*, which is a catalogue issued by Mr. Billings, on similar lines, of purely contemporary medical literature, we may estimate that the sum total of titles of additions to the world's medical literature would amount to about one such volume as the present every three years, which leaves us no doubt that the successors to Mr. Billings, the present librarian, will have occasion for all the indomitable activity and accuracy he has shown. In the twelfth volume, considerable use in various quarters has enabled us to find only one trifling misprint of a well-known physician's initials (xii. 449), but accuracy in such details is indispensable when we have to do with 136 authors of the name of Richter, 227 of the name of Smith, and 240 of the name of Schmidt. The student may be overwhelmed at first by the 39 imperial 8vo. pages that are required for a closely-printed catalogue of the titles of the literature of scarlet fever, but he will find that 46 pages are needed for rheumatism, 63 for small-pox, and 102 for surgery. Under these large headings the sub-indexing is excellent. The great importance of such a classification under subject-headings should never be lost sight of in a catalogue which deals mainly with matters of observation and natural science, for, in a large majority of cases, the importance of the record depends more on the observation than on the observer, and the student for whom all these volumes are such an invaluable help to knowledge is much more likely to be wishing to pursue an inquiry on a particular subject, regardless of those who wrote on it, than to trace out the works of a particular author regardless of what he wrote upon. However, Mr. Billings is extremely liberal to him, and gives him an excellent chance of doing both, of seeing all the vast mass of signed periodical literature as well as the books written on the particular subject, and also of seeing a list of all that each author has written with the exception of the articles in periodical literature that he has not republished, and he will find that many authors have republished in pamphlet form all that is worth reading.

The task of classification under subject-headings of all literature, both periodical and other, has been felt too enormous for any first-rate general library, and, so far as we know, has only been attempted by the Germans over comparatively small branches of knowledge, e.g. Carus and Engelmann's *Verzeichniss der Schriften über Zoologie welche in der periodische Werken enthalten*. The Royal Society's "Catalogue of the Scientific Papers contained in the Scientific Periodicals" (8 vols. 4to) contained only a list under authors' headings of the publications between

1800 and 1873, and did not attempt to deal with any subject-headings, or any of the past history of the subjects as Mr. Billings has done in his rich and varied Index Catalogue of very nearly all the Medical Literature printed between the fifteenth century and the present day.

A. T. MYERS.

OUR BOOK SHELF.

Lehrbuch der Botanik nach dem gegenwärtigen Stand der Wissenschaft. Bearbeitet von Dr. A. B. Frank. Zweiter Band: Allgemeine und Specielle Morphologie. 8vo, 431 pp. with 417 Woodcut Figures in the text, and an Index to Volumes I. and II. (Leipzig: Wilhelm Engelmann, 1893.)

THE first volume of this work, dealing with histology, anatomy, and physiology, was noticed in NATURE, vol. xlv. p. 610, where some facts may be found connected with its history, scope, and arrangement. The present volume is concerned with general morphology and special morphology, or classification. It is, on the whole, exceedingly well compiled, and, as was said of the first volume, it is written in the clearest and easiest style, with no superabundance of words, such as often render German text-books unnecessarily difficult to the beginner. The illustrations (upwards of 400) are for the greater part borrowed from the works of Sachs, Goebel, Schenk, Prantl, Pringsheim, Hanstein, Schimper, Strassburger, Hofmeister, De Bary, Tulasne, Bornet, Brefeld, Woronin, and other specialists, but chiefly from the first. These are all duly acknowledged, and, as the author states in his preface to the first volume, he has made the best selection he could, and he has used these familiar figures because he could not substitute better ones. This is, of course, true; yet we put it on record to inform the student that he will find little that is original in this way. General morphology occupies fifty-four pages, under four heads, namely: discrimination of forms in the vegetable kingdom, directions of growth, general laws of the relative positions of the members of the vegetable body, and origin of the members of the vegetable body. The remainder of the volume is devoted to special morphology, or systematic botany; but the large groups are somewhat unequally treated, 179 pages being devoted to cryptogams, as against 140 to phanerogams. Indeed, too much has been attempted in the space. For instance, the very brief diagnoses of the natural orders given at the end of this volume can be of little service to the beginner. Few of them exceed six lines, and many of them are even less, consequently the characters given are often insufficient to include half of the genera. Generally speaking, they are correct as far as they go, but they are often not sufficiently comprehensive. We have said that this is an excellent book, yet here and there one stumbles upon statements that cause no little surprise. Thus the pictures of *Nepenthes*, *Sarracenia*, and *Cephalotus* are described indiscriminately as transformed terminations of tendril-like continuations of the leaves. Then with regard to the bibliography, the selections are by no means critical, and sometimes defective, especially in foreign literature. The indexes, of which there are three, are sufficiently copious. There is an index to the woodcuts, an index to the subjects, and an index to the plant-names. When will authors learn that one general index is preferable to a number of classified references? In this work it would have been much more convenient to have had an index to each volume.

The Elements of Natural Science. Part III. Natural Philosophy. By Dr. H. Wettstein. (London: O. Newmann and Co., 1893.)

THE German edition of this book is obligatory for all the secondary schools of the canton of Zurich, which

partly accounts for the fact that more than seventeen thousand copies have been sold. It is doubtful, however, whether the translation will be so widely appreciated in England. There are already many excellent introductions to science covering practically the same ground as Dr. Wettstein's work. In one feature only is the book superior to the majority of those produced in England; viz. in the abundance of illustrations. As a rule, our text-books of science are very poorly off in this matter, whereas Ganot, and Deschanel, and the book before us, are brightened considerably by the insertion of numerous illustrations.

When we say that in the 138 pages of the book the sciences of mechanics, sound, light, heat, electricity, and magnetism are treated, it will be at once understood that the descriptions are of a rather sketchy nature. In spite of this, however, the book will give its readers a good grounding in the principles of physical science. Though most of the text can be easily comprehended by the average pupil, there are portions which should hardly be inserted without explanation. Thus, on p. 44 we read: "The atmospheric pressure carries our legs and arms, for the condyle of the femur fits air-tight into the acetabulum of the pelvis, and likewise the condyle of the humerus into the articular cavity of the shoulder-blade." And it is misleading to say: "The complete spectrum of sunlight consists of three parts—the heat spectrum, the light spectrum, and the chemical spectrum" (p. 71). The table of spectra given in the frontispiece is poor, one of its defects being that the solar spectrum only differs from the spectrum of Sirius by the addition of the three lines A, a, and B. With this exception, however, all the illustrations are very clear and accurate.

A Short Course in the Theory of Determinants. By L. G. Weld. (London: Macmillan, 1893.)

WE have read Prof. Weld's book with much interest, for though there are few, if any, novel results brought forward, he has certainly attained the goal he set before himself, and has developed the theory in a very simple manner. Some of the methods he has employed are new to us. The greater part of the work requires little beyond an intimate acquaintance with the principles of algebra as given in the ordinary school text-books. To confine the treatment within very moderate limits, there is no application of determinants to analytical geometry, but many of the more important algebraical applications find a place. After treating with sufficient detail of the origin and notation of determinants, our author gives a general definition of them, and enumerates and proves the more useful of their properties, and then touches lightly upon their applications to elementary algebra, *i.e.* to matrices and Sylvester's and Euler's methods of elimination. In Chapter vi. he briefly discusses the multiplication of determinants and reciprocal determinants. The last three chapters give a brief account of special forms, and of linear transformation. The text is very clearly printed, and we have detected but few trivial errors. There is a good store of examples, some of which appear to us to be rather "stiff." Due acknowledgment is made in the preface to the sources from which results have been derived.

A Practical Treatise on Bridge Construction. By T. Claxton Fidler, M.I.C.E. Second Edition, enlarged and revised. (London: Charles Griffin and Co., 1893.)

THE first edition of this book was reviewed at length in NATURE, vol. xxxviii. p. 2. Since then the Forth Bridge has been completed, and great advance has been made in the manufacture of steel.

The principal criticism to be added to the former review is that the author should add some remarks on the method of erecting a bridge, large or small. As it is, the structures